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Test of cleaning mops and cleaning cloths

(1 appendix)

Note: This is a revised version of report no KMp P5 04164 dated 2005-12-19.

Commission

At the request of the commissioner, Vikan AB, SP has tested the dust reduction performance and bacterial reduction performance of cleaning mops and cleaning cloths.

Items tested

Mops:

- Dry 21
- Dry 23
- Damp 41
- Damp 42
- Damp 43
- Damp 45
- Wet 61

Cloths:

- Vikan cloth original

Mop handle: Plastic, continuously adjustable, Vikan Ergo Clean

Mop head for test of mops: Vikan Ergo Clean

Mop head for test of cloths:

Vikan Ergo Clean supplied with a foam-rubber plate to simulate a hand.

Test surface for test of mops: Grey homogen polyurethane containing plastic carpet, Tarkett Eminent, untreated.

Test surface for test of cloths: Desk board, laminated wood imitation

Mops/cloth (washed once), mop handle, mop head and test surface was supplied by the client. Condition of test items on arrival at SP: no remarks.

Place and date of testing

The tests were carried out at SP in Borås during the period 23rd of November – 7th of December 2005.

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Test procedure

The test was based on SP method 2691 but was modified and extended with a bacterial test. The sampling procedure at each test point is shown in Figure 1 below (A = reference sample, B = with dust, C = after cleaning). The mop handle with mop head (without mop/cloth) was fastened on the wagon as in Figure 3. Thereafter the dry/moist/wet mop/cloth was mounted on the mop head and placed into start position (see Figure 2, test on carpet) on the test surface. The test points for dust reduction were located at the positions $L = 30$, $L = 50$ and $L = 70$. Bacteria were measured at points $-1/3 b:10$, $+1/3 b:10$, $0:90$, $-1/3 b:110$ and $+1/3 b:110$. For testing of the cloth Vikan-duken on the desk board, the distance between positions 10 and 110 in fig. 2 below was 47 cm instead of 100 for mops. The distance between $-1/3 b$ and $+1/3 b$ was 13 cm.

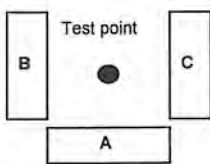


Figure 1. Cleaning direction downwards.

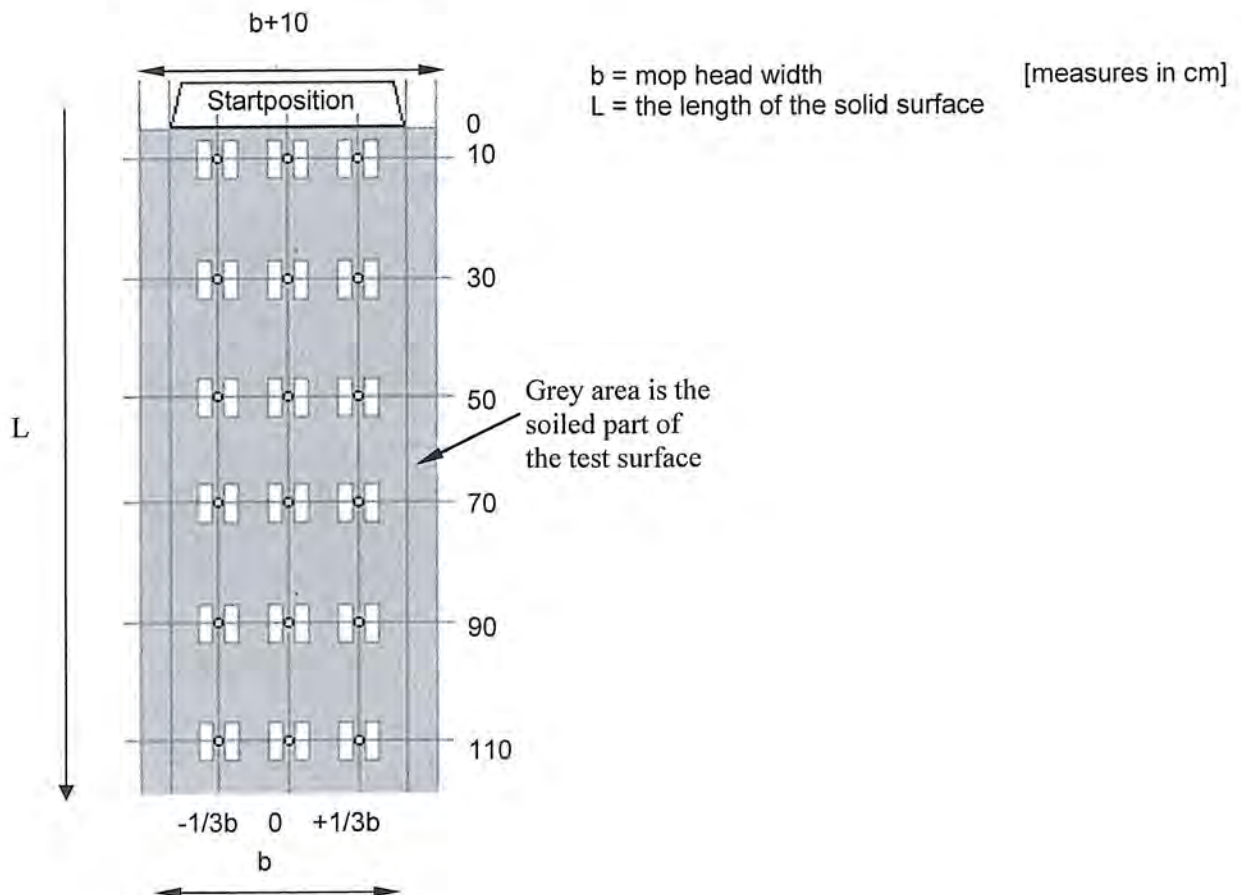


Figure 2. Test surface with position for each respective measuring point.

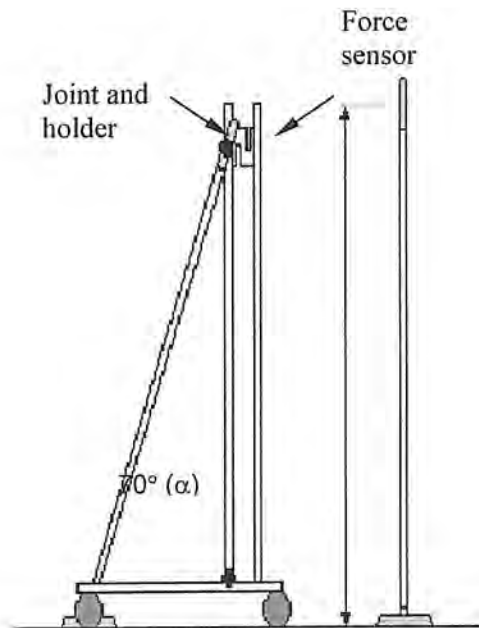


Figure 3. Mop handle and mop head secured to the holder on the trolley.

Before dirtying the test surface for measurements of dust reduction and bacterial reduction, it was wiped with 70 % ethanol and a test reference measurement was performed at 4 points for dust coverage percentage and 5 for bacterial counting. For bacteria, the reference sampling served as a control that the surface was able to clean from bacteria between samplings.

The surface was dirtied by using a test mixture and a foam rubber roller (width 100 mm). For test of mops the test mixture consisted of a sand¹/water-emulsion (for mops 0,0009/0,0048 g/m², for cloths 0,0005/0,0048 g/m²) mixed with 1 ml *Bacillus subtilis*² (CCUG 1658) bacteria grown overnight in nutrient broth (NB) at 30 ± 2°C. For testing the cloth, the dirt consisted of dry sand mixed with 1 ml bacteria. This mixture was dried in an incubator at 30 ± 2°C for about 2,5 h directly before testing.

The dirtying was done in all directions within a 120·(b+10) cm area. The dirt layer dried in air with the help of a 500 W halogen lamp. A final rolling in all directions with a dry and clean roller was done to "loosen up" the dirt. For every test a new roller was used in order to prevent bacteria from spreading between samplings.

After dirtying (i.e. before cleaning) the dust coverage percentage was measured at 9 points and bacteria at 5 points (to the left of the markings at the respective point, Figure 1).

The mop was placed in start position on the dirt-covered test surface (see Figure 2). The cleaning was performed by pulling the wagon backwards once at a constant speed (approx. 0,1 m/s) across the dirty test surface. After cleaning the surface any residual water was air dried using the lamp and the dust coverage percentage and bacteria were measured (to the right of the markings at respective point, Figure 1).

Bacteria were sampled by pressing rectangular agar plates for hygienic sampling on surfaces, 5,0 x 1,8 cm, named CultiDip combi (Merck) with TTC agar for total counts, at each point. These were then incubated at 30 ± 2°C for 2 days. Then the numbers of CFU (colony forming units) were counted on the plates. The dust coverage percentage before cleaning in the mop

¹ Arizona coarse dust

² This bacterium is a Gram-positive, spore-forming, very common species especially in soil, but the spores easily spread in air and it can be found almost everywhere. It can survive very tough conditions.

tests was about 30%, which can be regarded as a relatively severe dirt load. The quotient between dust coverage percentage after cleaning and before cleaning constitutes the dust reduction performance [%]. The quotient the numbers of CFU after and before cleaning constitutes the bacterial reduction potential. Each type of mop or cloth was tested in triplicate with different mops/cloths. The cloths were tested unfolded on the side without wash label with the stripes perpendicular to the cleaning direction. As a reference comparison Damp 41 was also tested with dust without bacteria during the period 2006-02-09 – 13 (see table 2 below).

Results

| | | Moisture ² (content of the test object) (%) | Dust reduction performance (%) | Bacterial reduction (%) |
|-------------|----|---|--------------------------------------|-------------------------------|
| Dry 21 | 1 | 0 | 29,0 | 38 |
| | 2 | 0 | 28,7 | ≥30* |
| | 3 | 0 | 33,5 | ≥42* |
| Dry 23 | 4 | 0 | 15,8 | ≥1* |
| | 5 | 0 | 10,7 | ≥29* |
| | 6 | 0 | 8,3 | ≥0* |
| Damp 41 | 7 | 175 | 33 | ≥84* |
| | 8 | 175 | 36,5 | ≥82* |
| | 9 | 175 | 37,7 | ≥86* |
| Damp 42 | 10 | 150 | 24,4 | ≥76* |
| | 11 | 150 | 21,4 | ≥78* |
| | 12 | 150 | 22,4 | 78 |
| Damp 43 | 13 | 150 | 22,9 | ≥80* |
| | 14 | 150 | 29,7 | ≥87* |
| | 15 | 150 | 30,4 | ≥73* |
| Wet 61 | 16 | 175 | 32 | ≥76* |
| | 17 | 175 | 33,6 | 64 |
| | 18 | 175 | 32,9 | 58 |
| Vikan duken | 19 | 150 | 91,5 | ≥94* |
| | 20 | 150 | 88,7 | ≥99* |
| | 21 | 150 | 93,4 | ≥96* |
| Damp 45 | 22 | 150 | 32 | 75 |
| | 23 | 150 | 42 | ≥75* |
| | 24 | 150 | 48,2 | ≥87* |

Table 1. *see Calculations below

² Quotient between the weight of added water and the total weight (mop and water)



The bacterial test only looked at "dirt-related" bacteria and not those that exist/grow on the surface itself. The reference samples showed that the numbers of bacteria on the surface after drying with ethanol between samplings were very low (0 – max. 3 CFU/5 samples, average 0). Separate values for single points are presented in appendix 1. The results are valid for the items tested only.

| | | Moisture ³ (content of the test object) (%) | Dust reduction performance (%) |
|---------|--|--|--------------------------------|
| Damp 41 | | 175 | 37,3 |
| | | 175 | 32,5 |
| | | 175 | 38,7 |

Table 2. Reference test without bacteria.

Calculations

Dust reduction performance, DR, has been calculated according to the following:

$$DR = \left(1 - \frac{\bar{A} - \bar{C}}{\bar{B} - \bar{C}}\right) \cdot 100 \text{ [%]}$$

where:

\bar{A} = Dust coverage percentage (Db) after cleaning

\bar{B} = Dust coverage percentage (Db) before cleaning

\bar{C} = Dust coverage percentage (Db) before dirtying (zero reference)

Bacterial reduction performance was calculated according to the following:

$$[(CFU \text{ before cleaning} - CFU \text{ after cleaning}) / CFU \text{ before cleaning}] \times 100 \text{ [%]}$$

CFU was calculated as an average at 5 points at each test before/after cleaning. The variation between points can be seen in appendix 1. On plates that had ≥ 300 CFU, the CFU was set to 300 (normal procedure when counting CFU) and the value for % bacterial reduction to $\geq x$ % (* in the table above). Therefore we have not calculated any standard deviation since it will be misleading.

Test equipment

- Balance: Mettler-Toledo PG 3001-S, SPs inventory no. 202 322
- Balance: AND GX 600. SPs inventory no. 301 087.
- Dust coverage percentage: BM Dust detector, SPs inventory no. 201 566 with gel tapes of the BM Dust lifter type.
- Incubator: Gallenkamp, SPs inventory no. 301 159.

Testing personnel

The bacterial reduction test was performed by Linda Eriksson and Susanne Ekendahl at SP KMp. Martina Hansson at SP ETf performed the dust reduction test.

³ Quotient between the weight of added water and the total weight (mop and water)



**SP Swedish National Testing and Research Institute
Chemistry and Materials Technology - Polymer Technology**

Ignacy Jakubowicz *Martina Hansson* *Susanne Ekendahl*
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Appendix

1. Raw data from the bacterial reduction test (8 pages).

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Dry 21

"Adjusted" counts, max 300
CFU

| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-------------------|-----|---------------------|-----|---------------------|-----|-------------------------|
| 1:A:1 | 2 | 1:B:1 | 240 | 1:C:1 | 57 | 76 |
| 1:A:3 | 0 | 1:B:3 | 250 | 1:C:3 | 112 | 55 |
| 1:A:5 | 0 | 1:B:5 | 300 | 1:C:5 | 221 | 20 |
| 1:A:7 | 0 | 1:B:7 | 297 | 1:C:7 | 284 | 4 |
| 1:A:9 | 0 | 1:B:9 | 293 | 1:C:9 | 160 | 45 |
| Average: 0 | | Average: 271 | | Average: 167 | | 40 |

| | | | | | | |
|-------------------|---|---------------------|-----|---------------------|-----|-----------|
| 2:A:1 | 0 | 2:B:1 | 300 | 2:C:1 | 173 | 42 |
| 2:A:3 | 1 | 2:B:3 | 300 | 2:C:3 | 112 | 63 |
| 2:A:5 | 0 | 2:B:5 | 300 | 2:C:5 | 197 | 34 |
| 2:A:7 | 0 | 2:B:7 | 300 | 2:C:7 | 295 | 2 |
| 2:A:9 | 0 | 2:B:9 | 300 | 2:C:9 | 280 | 7 |
| Average: 0 | | Average: 300 | | Average: 211 | | 30 |

| | | | | | | |
|-------------------|---|---------------------|-----|---------------------|-----|-----------|
| 3:A:1 | 0 | 3:B:1 | 115 | 3:C:1 | 35 | 70 |
| 3:A:3 | 0 | 3:B:3 | 75 | 3:C:3 | 62 | 17 |
| 3:A:5 | 1 | 3:B:5 | 300 | 3:C:5 | 246 | 18 |
| 3:A:7 | 0 | 3:B:7 | 300 | 3:C:7 | 181 | 40 |
| 3:A:9 | 0 | 3:B:9 | 300 | 3:C:9 | 103 | 66 |
| Average: 0 | | Average: 218 | | Average: 125 | | 42 |



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"Adjusted" counts, max 300

Dry 23

| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-------------------|-----|---------------------|-----|---------------------|-----|------------------------------------|
| 4:A:1 | 0 | 4:B:1 | 70 | 4:C:1 | 109 | -56 |
| 4:A:3 | 1 | 4:B:3 | 130 | 4:C:3 | 268 | -106 |
| 4:A:5 | 0 | 4:B:5 | 300 | 4:C:5 | 219 | 27 |
| 4:A:7 | 0 | 4:B:7 | 190 | 4:C:7 | 158 | 17 |
| 4:A:9 | 0 | 4:B:9 | 300 | 4:C:9 | 243 | 19 |
| Average: 0 | | Average: 198 | | Average: 199 | | Bacterial reduction [%]: -1 |
| 5:A:1 | 1 | 5:B:1 | 156 | 5:C:1 | 84 | 46 |
| 5:A:3 | 0 | 5:B:3 | 69 | 5:C:3 | 45 | 35 |
| 5:A:5 | 0 | 5:B:5 | 300 | 5:C:5 | 202 | 33 |
| 5:A:7 | 0 | 2:B:7 | 300 | 5:C:7 | 264 | 12 |
| 5:A:9 | 0 | 2:B:9 | 300 | 5:C:9 | 206 | 31 |
| Average: 0 | | Average: 225 | | Average: 160 | | Bacterial reduction [%]: 29 |
| 6:A:1 | 0 | 6:B:1 | 93 | 6:C:1 | 105 | -13 |
| 6:A:3 | 0 | 6:B:3 | 129 | 6:C:3 | 55 | 57 |
| 6:A:5 | 1 | 6:B:5 | 124 | 6:C:5 | 251 | -102 |
| 6:A:7 | 0 | 6:B:7 | 202 | 6:C:7 | 164 | 19 |
| 6:A:9 | 0 | 6:B:9 | 300 | 6:C:9 | 272 | 9 |
| Average: 0 | | Average: 170 | | Average: 169 | | Bacterial reduction [%]: 0 |

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"Adjusted" counts, max 300

Damp 41

| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 7:A:1 | 1 | 7:B:1 | 114 | 7:C:1 | 54 | 53 |
| 7:A:3 | 0 | 7:B:3 | 197 | 7:C:3 | 18 | 91 |
| 7:A:5 | 0 | 7:B:5 | 300 | 7:C:5 | 49 | 84 |
| 7:A:7 | 0 | 7:B:7 | 300 | 7:C:7 | 48 | 84 |
| 7:A:9 | 0 | 7:B:9 | 300 | 7:C:9 | 27 | 91 |
| Average: | 0 | Average: | 242 | Average: | 39 | Bacterial reduction [%]: 84 |

| | | | | | | |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 8:A:1 | 0 | 8:B:1 | 155 | 8:C:1 | 23 | 85 |
| 8:A:3 | 0 | 8:B:3 | 210 | 8:C:3 | 28 | 87 |
| 8:A:5 | 0 | 8:B:5 | 300 | 8:C:5 | 46 | 85 |
| 8:A:7 | 0 | 8:B:7 | 300 | 8:C:7 | 80 | 73 |
| 8:A:9 | 0 | 8:B:9 | 300 | 8:C:9 | 49 | 84 |
| Average: | 0 | Average: | 253 | Average: | 45 | Bacterial reduction [%]: 82 |

| | | | | | | |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 9:A:1 | 0 | 9:B:1 | 163 | 9:C:1 | 24 | 85 |
| 9:A:3 | 0 | 9:B:3 | 300 | 9:C:3 | 30 | 90 |
| 9:A:5 | 0 | 9:B:5 | 300 | 9:C:5 | 43 | 86 |
| 9:A:7 | 0 | 9:B:7 | 300 | 9:C:7 | 33 | 89 |
| 9:A:9 | 0 | 9:B:9 | 300 | 9:C:9 | 56 | 81 |
| Average: | 0 | Average: | 273 | Average: | 37 | Bacterial reduction [%]: 86 |



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 Damp 43

"Adusted"counts, max 300



| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 13:A:1 | 0 | 13:B:1 | 96 | 13:C:1 | 37 | 61 |
| 13:A:3 | 0 | 13:B:3 | 77 | 13:C:3 | 18 | 77 |
| 13:A:5 | 0 | 13:B:5 | 300 | 13:C:5 | 49 | 84 |
| 13:A:7 | 0 | 13:B:7 | 300 | 13:C:7 | 54 | 82 |
| 13:A:9 | 0 | 13:B:9 | 300 | 13:C:9 | 57 | 81 |
| Average: | 0 | Average: | 215 | Average: | 43 | Bacterial reduction [%]: 80 |

| | | | | | | |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 14:A:1 | 0 | 14:B:1 | 138 | 14:C:1 | 17 | 88 |
| 14:A:3 | 0 | 14:B:3 | 300 | 14:C:3 | 15 | 95 |
| 14:A:5 | 1 | 14:B:5 | 300 | 14:C:5 | 37 | 88 |
| 14:A:7 | 0 | 14:B:7 | 300 | 14:C:7 | 46 | 85 |
| 14:A:9 | 0 | 12:B:9 | 300 | 14:C:9 | 53 | 82 |
| Average: | 0 | Average: | 268 | Average: | 34 | Bacterial reduction [%]: 87 |

| | | | | | | |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 15:A:1 | 0 | 15:B:1 | 65 | 15:C:1 | 36 | 45 |
| 15:A:3 | 0 | 15:B:3 | 127 | 15:C:3 | 46 | 64 |
| 15:A:5 | 0 | 15:B:5 | 300 | 15:C:5 | 85 | 72 |
| 15:A:7 | 0 | 15:B:7 | 300 | 15:C:7 | 63 | 79 |
| 15:A:9 | 0 | 15:B:9 | 300 | 15:C:9 | 68 | 77 |
| Average: | 0 | Average: | 218 | Average: | 60 | Bacterial reduction [%]: 73 |

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 "Adjusted" counts, max 300
 Wet 61



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| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 16:A:1 | 0 | 16:B:1 | 41 | 16:C:1 | 48 | -17 |
| 16:A:3 | 0 | 16:B:3 | 62 | 16:C:3 | 28 | 55 |
| 16:A:5 | 0 | 16:B:5 | 300 | 16:C:5 | 56 | 81 |
| 16:A:7 | 0 | 16:B:7 | 300 | 16:C:7 | 53 | 82 |
| 16:A:9 | 0 | 16:B:9 | 270 | 16:C:9 | 51 | 81 |
| Average: | 0 | Average: | 195 | Average: | 47 | Bacterial reduction [%]: 76 |

| | | | | | | |
|-----------------|----------|-----------------|------------|-----------------|-----------|------------------------------------|
| 17:A:1 | 0 | 17:B:1 | 110 | 17:C:1 | 38 | 65 |
| 17:A:3 | 0 | 17:B:3 | 93 | 17:C:3 | 43 | 54 |
| 17:A:5 | 0 | 17:B:5 | 170 | 17:C:5 | 62 | 64 |
| 17:A:7 | 0 | 17:B:7 | 133 | 17:C:7 | 59 | 56 |
| 17:A:9 | 0 | 17:B:9 | 192 | 17:C:9 | 52 | 73 |
| Average: | 0 | Average: | 140 | Average: | 51 | Bacterial reduction [%]: 64 |

| | | | | | | |
|-----------------|----------|-----------------|-----------|-----------------|-----------|------------------------------------|
| 18:A:1 | 0 | 18:B:1 | 60 | 18:C:1 | 20 | 67 |
| 18:A:3 | 0 | 18:B:3 | 70 | 18:C:3 | 20 | 71 |
| 18:A:5 | 0 | 18:B:5 | 105 | 18:C:5 | 44 | 58 |
| 18:A:7 | 0 | 18:B:7 | 113 | 18:C:7 | 52 | 54 |
| 18:A:9 | 0 | 18:B:9 | 117 | 18:C:9 | 61 | 48 |
| Average: | 0 | Average: | 93 | Average: | 39 | Bacterial reduction [%]: 58 |

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 Vikan cloth
 original

"Adjusted" counts, max 300

| Ref sample | | CFU | With dirt | | CFU | After cleaning | | CFU | Bacterial reduction [%] |
|-----------------|----------|------------|-----------------|------------|-----------------|----------------|-----|---------------------------------|-------------------------|
| 19:A:1 | 0 | 300 | 19:B:1 | 300 | 19:C:1 | 69 | 77 | | |
| 19:A:3 | 0 | 300 | 19:B:3 | 300 | 19:C:3 | 0 | 100 | | |
| 19:A:5 | 0 | 300 | 19:B:5 | 300 | 19:C:5 | 10 | 97 | | |
| 19:A:7 | 0 | 300 | 19:B:7 | 300 | 19:C:7 | 6 | 98 | | |
| 19:A:9 | 0 | 300 | 19:B:9 | 300 | 19:C:9 | 1 | 100 | | |
| Average: | 0 | 300 | Average: | 300 | Average: | 17 | | Bacterial reduction [%]: | 94 |

| | | | | | | | | | |
|-----------------|----------|------------|-----------------|------------|-----------------|----------|-----|---------------------------------|-----------|
| 20:A:1 | 0 | 300 | 20:B:1 | 300 | 20:C:1 | 8 | 97 | | |
| 20:A:3 | 0 | 300 | 20:B:3 | 300 | 20:C:3 | 2 | 99 | | |
| 20:A:5 | 0 | 300 | 20:B:5 | 300 | 20:C:5 | 4 | 99 | | |
| 20:A:7 | 0 | 300 | 20:B:7 | 300 | 20:C:7 | 4 | 99 | | |
| 20:A:9 | 0 | 300 | 20:B:9 | 300 | 20:C:9 | 1 | 100 | | |
| Average: | 0 | 300 | Average: | 300 | Average: | 4 | | Bacterial reduction [%]: | 99 |

| | | | | | | | | | |
|-----------------|----------|------------|-----------------|------------|-----------------|-----------|-----|---------------------------------|-----------|
| 21:A:1 | 0 | 300 | 21:B:1 | 300 | 21:C:1 | 48 | 84 | | |
| 21:A:3 | 1 | 300 | 21:B:3 | 300 | 21:C:3 | 5 | 98 | | |
| 21:A:5 | 0 | 300 | 21:B:5 | 300 | 21:C:5 | 1 | 100 | | |
| 21:A:7 | 0 | 300 | 21:B:7 | 300 | 21:C:7 | 2 | 99 | | |
| 21:A:9 | 0 | 300 | 21:B:9 | 300 | 21:C:9 | 2 | 99 | | |
| Average: | 0 | 300 | Average: | 300 | Average: | 12 | | Bacterial reduction [%]: | 96 |

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Damp 45

"Adjusted" counts, max 300



| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|---------------------------------|
| 22:A:1 | 0 | 22:B:1 | 70 | 22:C:1 | 28 | 60 |
| 22:A:3 | 0 | 22:B:3 | 85 | 22:C:3 | 19 | 78 |
| 22:A:5 | 1 | 22:B:5 | 134 | 22:C:5 | 40 | 70 |
| 22:A:7 | 0 | 22:B:7 | 239 | 22:C:7 | 31 | 87 |
| 22:A:9 | 0 | 22:B:9 | 162 | 22:C:9 | 52 | 68 |
| Average: | 0 | Average: | 138 | Average: | 34 | Bacterial reduction [%]: |
| | | | | | | 75 |

| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|---------------------------------|
| 23:A:1 | 0 | 23:B:1 | 61 | 23:C:1 | 7 | 89 |
| 23:A:3 | 0 | 23:B:3 | 125 | 23:C:3 | 47 | 62 |
| 23:A:5 | 0 | 23:B:5 | 300 | 23:C:5 | 44 | 85 |
| 23:A:7 | 0 | 23:B:7 | 205 | 23:C:7 | 58 | 72 |
| 23:A:9 | 0 | 23:B:9 | 184 | 23:C:9 | 65 | 65 |
| Average: | 0 | Average: | 175 | Average: | 44 | Bacterial reduction [%]: |
| | | | | | | 75 |

| Ref sample | CFU | With dirt | CFU | After cleaning | CFU | Bacterial reduction [%] |
|-----------------|----------|-----------------|------------|-----------------|-----------|---------------------------------|
| 24:A:1 | 0 | 24:B:1 | 51 | 24:C:1 | 6 | 88 |
| 24:A:3 | 1 | 24:B:3 | 70 | 24:C:3 | 5 | 93 |
| 24:A:5 | 0 | 24:B:5 | 291 | 24:C:5 | 48 | 84 |
| 24:A:7 | 0 | 24:B:7 | 300 | 24:C:7 | 34 | 89 |
| 24:A:9 | 0 | 24:B:9 | 300 | 24:C:9 | 35 | 88 |
| Average: | 0 | Average: | 202 | Average: | 26 | Bacterial reduction [%]: |
| | | | | | | 87 |

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